In Vitro Skin Corrosion Test: Reproducibility Over Time and Optimized Methodology for Testing Chemicals Interfering with the MTT endpoint

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The potential for chemicals to cause skin effects such as corrosion is a concern of industrial toxicologists in their assessments of possible worker and consumer safety issues. Moreover, the U.S. Department of Transportation (DOT), the new regulation on the Registration, Evaluation and Authorization of Chemicals (REACH), and other international and national regulatory agencies require that substances should be labeled as to skin corrosivity potential.

In the past, skin corrosion assessments were based on tests involving topical application of test substances to the skin of rabbits. However, based on two ECVAM Validation studies performed during 1996-2000 (Fentem et al., Toxicology in Vitro 12, 483-524, 1998; Liebsch et al., ATLA 28, 371-401, 2000) with two reconstructed human skin models (EpiDerm and EPISKIN), the OECD approved use of skin models as regulatory accepted methods (OECD TG 431) replacing the in vivo test.

In the present study, the EpiDerm skin corrosion test was repeated with the commercially available test substances previously used in both ECVAM validation studies. The aim was to demonstrate the long term reproducibility and reliability of the EpiDerm model and the method, as required by regulators (Rispin et al., Regul. Toxicol. Pharmacol. 45 (2), 97-103, 2006). The data obtained show very good correlation over a period of 7 years. We also conducted a formalized evaluation of a procedural modification proposed several years ago to correctly predict the corrosive potential of materials that interfere with the MTT endpoint normally used in the method. An attempt was made to optimize this method and demonstrate with several chemicals (sometimes reported to be false negatives) the predictive capacity of the EpiDerm corrosivity assay when this procedural modification is included. The presentation will summarize data from the above mentioned studies and describe optimized methods for assessing materials which interfere with the MTT endpoint.

Keywords: EpiDerm, skin corrosion, REACH, MTT endpoint, regulatory toxicology
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